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STRATEGY OF FISH SEED PRODUCTION IN INDIA

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ABSTRACT

In tropical countries like India, climatic conditions vary in different parts, as a result the breeding of fast growing species such as Catla and silver carps poses considerable problems due to erratic or late monsoon or prolonged dry spell. Hence we are unable to meet the fish seed requirement of the country. Therefore, to meet the future requirement and to over-come the environmental conditions a Modern carp Hatchery CIFE D-81 had been designed. The system provides optimum temperature, silt free clean, cool, highly oxygenated water, low current and continuous removal of metabolites It has been successfully demonstrated at Rawatbhata (Rajasthan), Badkhal (Haryana), Badbhada (M.P). Guntur and East Godavari District, (A.P) Recently Modern Carp Hatchery has been installed in semi-arid zone, Damdama (Haryana), during 1984, where it has produced record 1.88 crores of fish seed and worked successfully.

INTRODUCTION

India has vast potential resources in Inland Fisheries. Approximately 7 35 lakh ha. of ponds and tanks, 14.47 lakhs ha. of reservoirs and 9.02 lakhs ha. of brackish water and about 29,000 km of rivers, and canals constitute inland fisheries resources in the country. All these resources together contribute about 1 00 m. tonne of fish in inland sector. By the end of 2000 A.D. India would need 7.00 m. tonnes of fish from inland sector (Dwivedi, 1985).

At present most of the fresh water fish production is contributed by capture fisheries, any addition or increase from this source is not possible because the capture inland fisheries resources have undergone drastic ecological changes due to domestic and industrial pollution, construction of barrages, dams and annicuts and diversion of water for irrigation and other use. Therefore to meet the requirement of 2000 A. D. we have to strengtnen and depend on the culture fishery This only will be possible if we can be able to design a system in which the following constraints should be removed.

CONSTRAINTS

1. One of ths major constraint for development of fresh water fish culture in India is the non availability of the seed of Indian and Chinese carps.

2. India's present annual requirement is 16 billion fish fry and the present production is only around 1.0 billion fry.

3. Most of the fish fry is produced in West Bengal either by collection from natural sources or by Budh Breeding, and is inadequate to meet the demand of the country.

4. The technique of Induced Breeding was developed about two decades ago but breeding of Catla and Silver Carp which are fast growing species is still a problem.

5. The 6th Workshop of the All India Coordinated Research Project on Composite Fish Culture and Fish Seed Production held at Bhubneswar on 1st and 2nd July, 1982 indentified that the production and the procurement of the seed of Catla and Silver Carp are major problems.

6. In the last Regional Committee Meeting of ICAR which was held at Bhopal during January, 1982, the Director of Fisheries, Government of Maharashtra had indicated that due to the erratic or late monsoon or prolonged dry and hot spell, the fishes do not breed and eggs are reabsorbed.

7. One of the major constraint is the high mortality due to fluctuations in environmental parameters like temperature, oxygen, pH, silt, water flow and space for movement of eggs limits large scale seed production.

During last three decades various attempts had been made to develop a suitable new system for production of major carp seeds on large scale by aquaculture. Many methods ranging from controlled breeding and hatching have been evolved. Dwivedi & Zaidi, 1983, had already explained the detailed account of different types of systems adopted from time to time.

Therefore, one of the major requirement in the aquaculture is the appropriate technology for breeding, hatching and rearing of fish through a standardised method which has application at National scale. In the tropical countries like India climatic conditions vary in different parts. As a result the breeding of fast growing species such as Catla and Silver carp poses considerable problems due to erratic or late monsoon or prolonged dry spell, hence, the eggs get reabsorbed.

MODER CARP HATCHERY MODEL CIFE D-81

To overcome these dificulties, recently in 1981, a carp Hatchery named "MODERN CARP HATCHERY MODEL CIFE D-8." has been designed (Dwivedi & Ravindranathan, 1982). In this hatchery ststem there is a provision to control the environmental conditions. The system ensures controlled optimum temperature, silt free clean, cool, highly oxygenated water, slow current and continuous removal of metabolites. Hence, fishes are induced to breed in this unit where natural conditions as prevalent in rivers have been simulated. A revised Hatchery Jar D-85 of 0.8 million eggs capacity have been disigned recently.

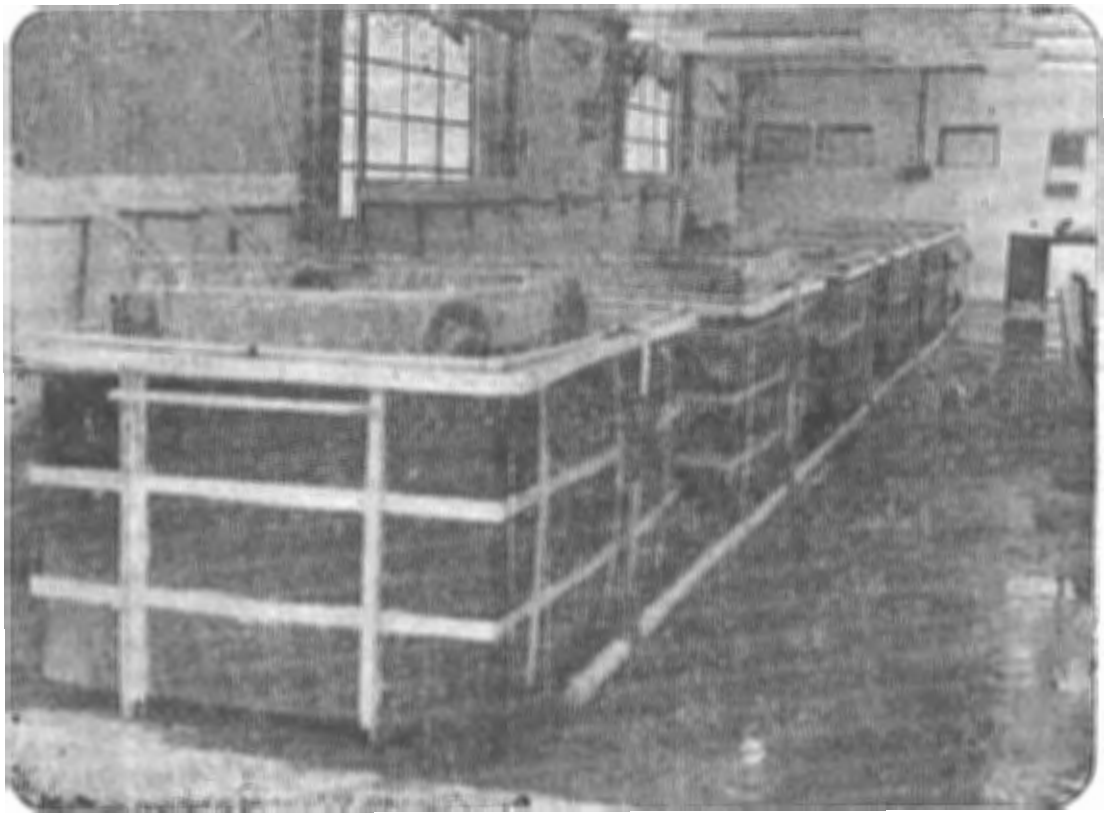

Fig. 1. Modern Carp Hatcheri model CIFE D-81

Modern Carp Hatchery essentially consists of breeding and Hatching units (Fig 1 & 2). The breeding unit comprises of large pools with spray, showers, cooling towers and water circulatory system. The Hatchery unit consists vertical jars each having a capacity of 40 litres. Filtere and oxygenated water is used in the unit. Showers and spray systems are provided to cool and arate the water and increase oxygen content. The hatchery unit ensure sufficient oxygen, prevents accumulation of CO_2 and other metabolites.

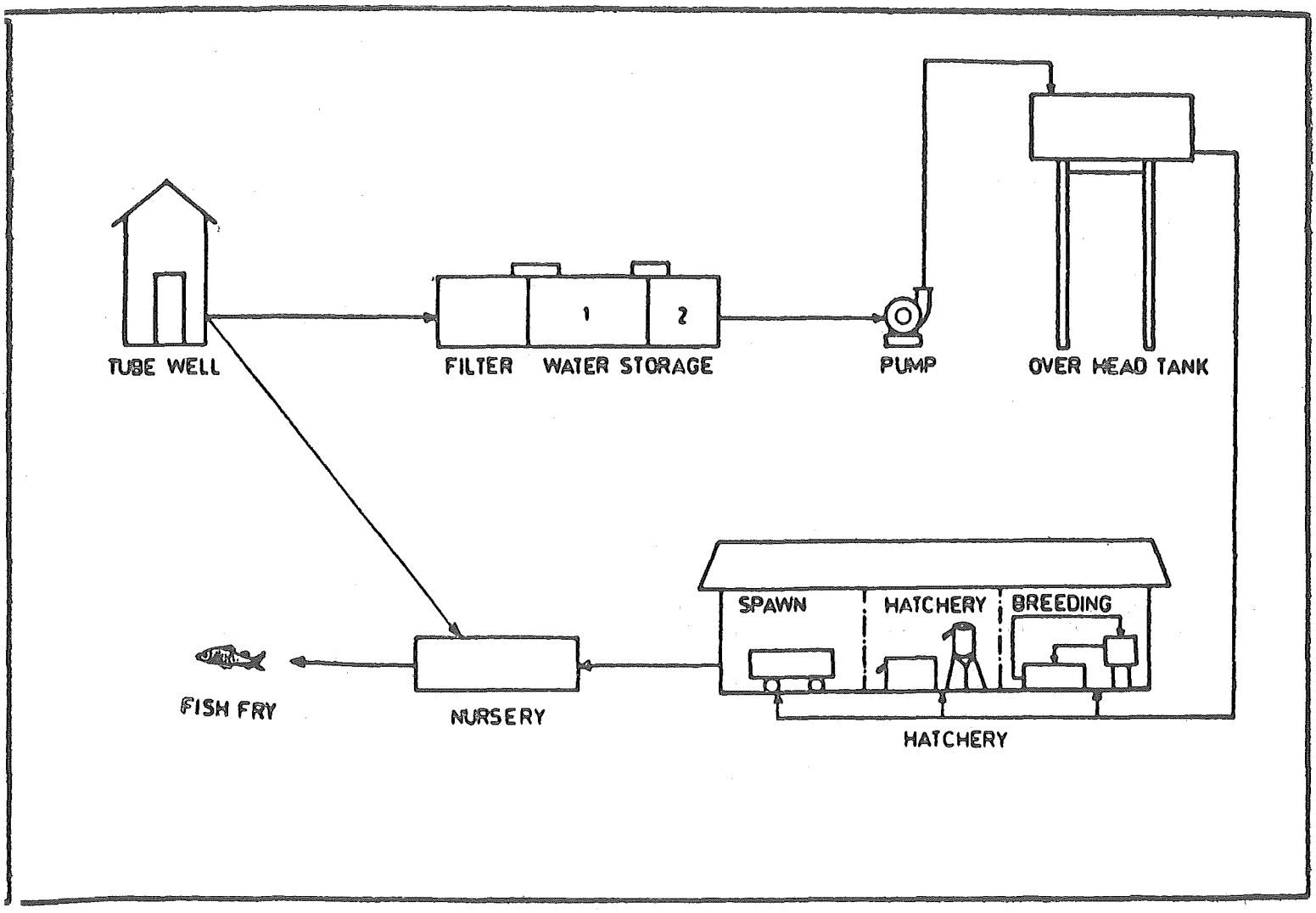

Fig. 2. Flow Diagram of Fish Hatchery, (CIFF D-81) of Damdama, Haryana.

Both the breeding and hatchery units are installed in an air conditioned or air cooled room which ensures controlled conditions. This new system provideds controlled temperature around 27°C, high oxygen between 7 to 9 mg/1, slow water current, continuous removal of metabolites and assures breeding and percentage of hatching above 90%. In dry climate air cooling itself gives desired results.

During the year 1980 and 1981 successful hatching was demonstrated at 1. Rawathbhata Fish Farm in Rajasthan and 2. Bodkal Fish Farm in Haryana. 3. Bhadbhada Fish Farm, Bhopal in M P. 4. Fresh Water Fish Farm, Balabhadrapuram in A.P. 5 Kutelabhata Fish Farm, Raipur. M P.(Dwivedi & Ravindranathan, 82)

INSTALLATION OF HATCHERY IN SEMI-ARID ZONE

In semi-arid zone temperature variations are very high. During winter temperature goes down to 5°C or even less and in summer it exceeds to 45° C. Rains delayed and irregular. Climatic conditions are adverse in these areas and not suitable for fish culture purposes. Therefore trial experiments on the fish breeding in Damdama, Dist. Gurgaon (Haryana) were undertaken 1982-1984 (CIFE Report 1985)

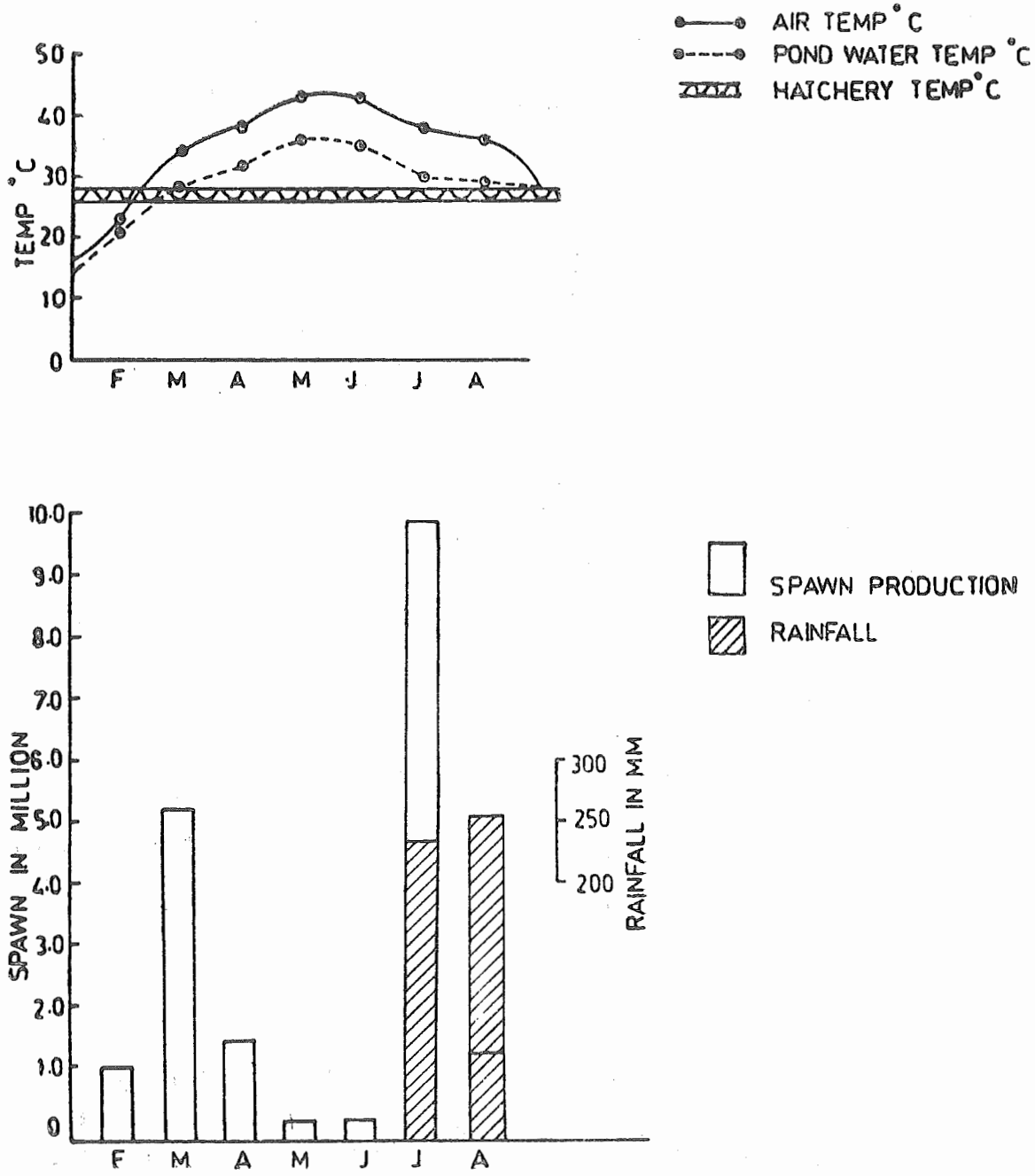

Fig. 3. Breeding Rainfail and temperature at Damdama, during 1984.

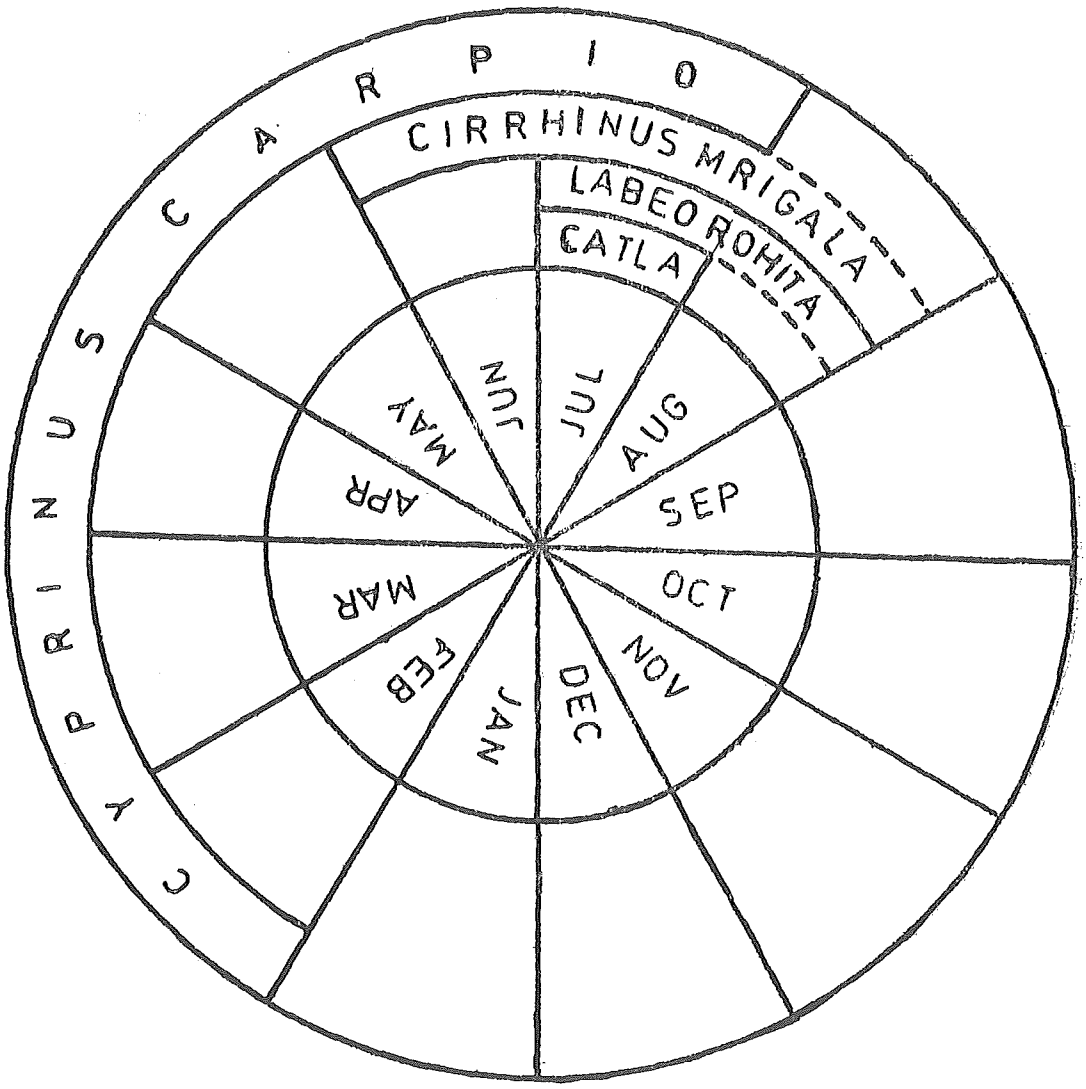

Fig. 4. Calender showing the culture schedule at Damdama.

Damdama in the semi-arid zone of Haryana is situated at 28$_o$4' N. latitude and 77°E. longitude. The fish seed farm is located on the western bank of Damdama reservoir, which has an area of 305 acres in the vicinity of Aravalli Hills. The reservoir has a command area of 3,000 acres for irrigation, which is fed by a 32,500 ft. long canal, which passes adjacent to the northern side of the farm.

Reservir water through seepage comes to farm ponds, therefore the ponds are never dry. Ground water level is 10-15 ft. which provides a good source of unpolluted fresh water.

Table 1 : Spawn Production of Common Carp and Indian Major Carps in Semi-Arid Zone at Damdama, Haryana.

Species	Spawn in lakhs		
	1982	1983	1984
Catla catla	8.00	9.00	19.45
Cirrhinus mrigala	20.00	20.00	32.50
Labeo rohita	21.00	23.00	58.30
Cyprinus carpio	10.00	14.00	81.30

Fish seed requirement of Haryana is very high and it is increasing every year. Earlier, Fisheries Department used to import the seed from Calcutta to meet the demand of the State. Erfforts were made by the Department of Fisheries, Haryana to produce seed using induced breeding techniques at its farms, but success could not be achieved which may be due to adverse climatic conditions of the region. To meet the demand of seed of the State and for the development of fish seed production system for semi-arid zone of the country, Central Institute of Fisheries Education, Bombay started a project in collaboration with State Fisheries Departmant to study the problems associated with fish seed production in semi-arid zone and installed a 24 jar LDPE Modern Fish Hatchery Model CIFE D-81 at Damdama Fish Seed Farm, The results of the studies are presented in Fig 3, & 4 and Table-1. A record production of 1.88 crores of fish seed was achived in semi-arid zone of Haryana during 1984.

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